PATENT
Atty Docket No. TFEL0001

I HEREBY CERTIFY THAT ON APRIL 22, 2010, THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO: MAIL STOP APPEAL BRIEF – PATENTS, COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450.

STEVEN W. SMYRSKI

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	Confirmation No.: 2026
MICHAEL DANIELS, ET AL.	Group Art Unit: 3742
Title: HEATING BLANKET	Examiner: Vinod D. Patel
Serial No.: 10/564,566	
§371 Filing Date: JANUARY 13, 2006	

APPELLANTS' BRIEF

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is an appeal from the final rejection of the Examiner dated December 8, 2009 in the above-referenced application.

1. Real Party in Interest

The real party in interest is Thermocable (Flexible Elements) Limited, a corporation of the United Kingdom, and an assignment of the application to Thermocable (Flexible Elements) Limited is recorded at the United States Patent and Trademark Office at Reel 024242, Frame 0346.

2. Related Appeals and Interferences

There are no related appeals or interferences known to the Appellants.

3. Status of the Claims

Claims 1-3, 12, 13, and 17 stand finally rejected and are the subject of this appeal. A complete listing of the claims as pending is reproduced in the Appendix.

The final rejection of claims 1-3, 12, 13, and 17 is the subject of this appeal.

4. Status of Amendments

No amendments were filed after the final rejection.

5. Summary of Claimed Subject Matter

The present design is for a heating blanket including a cable provided to address issues of overheating. [Specification, p. 1, paragraph 2][1] The heating cable comprises first and second conductors extending along the length of the cable and which are separated by a separation layer [Abstract; FIG. 1; first conductor 1; second conductor 5; separation layer 4; Specification, p. 4, paragraph 3; p. 5, paragraph 6; p. 6, paragraph 2] The conductors and separation layer may be coaxial. [Abstract; FIG. 1; Specification, p. 4, paragraph 4] The first and second conductors are connected at one end of the cable in

[1] Throughout this document, reference is made to the original PCT document from which this §371 filing originates, corresponding to the WO2005/009080 A1 publication. Also, reference is made herein to page and paragraph numbers from the aforementioned original PCT document. For example, "p. 5, paragraph 2" refers to the second full paragraph on page 5 of the PCT document, i.e. the paragraph beginning with "When the cable is connected..."

series such that if the first and second conductors are connected at the other end of the cable to respective poles of a power supply, *equal currents flow in opposite directions through adjacent portions of the conductors.* [Abstract; Specification, p. 4, paragraph 3; p. 7, paragraph 3] This equal current flow aspect substantially eliminates electromagnetic radiation being emitted from the cable. [Abstract; Specification, p. 7, paragraph 3] The first conductor has a positive temperature characteristic and the separation layer has a negative temperature characteristic. [Abstract; Specification, p. 6, paragraph 2; p. 7, paragraph 3]

Regarding individual claims, independent claim 1 currently recites:

A heating cable comprising:

a first conductor which extends along the length of the cable;

a second conductor which extends along the length of the cable;

a separation layer which extends along the length of the cable and is interposed between the first and second conductors; and

an outer insulating jacket extending along the length of the cable and around the first and second conductors and the separation layer;

wherein the first and second conductors are connected at a first end of the cable in series such that current can flow in both directions through the first and second conductors and when the first and second conductors are connected at a second end of the cable to an AC power supply equal currents flow in opposite directions through adjacent portions of the first and second conductors; and

wherein the separation layer is formed such that the separation layer has a negative temperature characteristic, and the first conductor is formed such that the first conductor has a positive temperature characteristic.

The embodiments presented in the Specification disclose a heating cable [Abstract; FIGs. 1 and 2; Specification, p. 4, paragraph 3; p. 5, paragraph 4; p. 5, paragraph 6; p. 6, paragraph 1; and in other places throughout the Specification], as well as a first conductor which extends along the length of the cable [first conductor 1, core 1; FIG. 1; Abstract; Specification, p. 4, paragraph 3; p. 4, paragraph 5; p. 5, paragraph 6] and a second conductor which extends along the length of the cable [second conductor 5, heating wire 5; FIG. 1; Abstract; Specification, p. 4, paragraph 3; p. 4, paragraph 5; p. 5, paragraph 6].

Embodiments of the present design further include a separation layer which extends along the length of the cable and is interposed between the first and second conductors [separation layer 4; FIG. 1; Abstract; Specification, p. 4, paragraph 3; p. 5, paragraph 6] and an outer insulating jacket extending along the length of the cable and around the first and second conductors and the separation layer [extruded jacket 6; FIG. 1; Specification, p. 5, paragraph 6].

The first and second conductors are connected at a first end of the cable in series such that current can flow in both directions through the first and second conductors [Abstract; FIG. 2; Specification, p. 4, paragraph 3; p. 5, paragraph 2] and when the first and second conductors are connected at a second end of the cable to an AC power supply equal currents flow in opposite directions through adjacent portions of the first and second conductors [Abstract; Specification, p. 4, paragraph 3].

Embodiments of the invention also show the separation layer formed such that the separation layer has a negative temperature characteristic [Abstract; Specification, p. 5, paragraph 1; p. 6, paragraph 2; p. 8, paragraph 1] and the first conductor is formed such that the first conductor has a positive temperature characteristic [Abstract; Specification, p. 4, paragraph 3; p. 5, paragraph 6; p. 6, paragraph 2; p. 7, paragraph 2; p. 8, paragraph 1].

6. Grounds of Rejection to be Reviewed on Appeal

Rejection of claims 1-3, 12-13, and 17, including independent claim 1, under 35 U.S.C. §103 based on Mills, U.S. Patent 4,677,281 ("Mills") in view of Gordon Jr., U.S. Patent 3,222,497 ("Gordon Jr.") in further view of Sopory, U.S. Patent 6,492,629 ("Sopory").

7. Argument

The cited references, in particular the primary Mills reference, address different issues with heating devices and simply do not show a design "wherein ... when the first and second conductors are connected at a second end of the cable to an AC power supply *equal currents flow in opposite directions through adjacent portions of the first and second conductors...*" Additional differences exist between the claims and cited references, as discussed below, but the clear inability of the Mills reference or any other cited reference to operate wherein "equal currents flow in opposite directions" as claimed in claim 1 is of particular interest.

A. "equal currents flow in opposite directions through adjacent portions of the first and second conductors..."

Appellants submit that basic construction of a heating apparatus such as that claimed provides one or more conductors through which current flows, and resistance of the conductors together with current provide heating. The level of current provided can be high, and heating cables having this type of construction can overheat and be hazardous. As a result of these issues, certain heating cables employed in blankets, heating pads, and the like, employ conductors functioning as sensor wires that enable monitoring of temperature along the length of the heating cable. One such heating cable/sensor design is discussed early in the present application, namely Gerrard, U.S. Patent 6,310,332. With respect to the Gerrard patent, Appellants state:

> In the embodiment of Figures 2 and 3 one conductor carries the heating current whereas the other is used for sensing purposes [PTC sensor wire 16]. The sensing conductor may also have a positive resistance characteristic (PTC) to provide an additional means for monitoring temperature along the length of the cable.

Specification, p. 3, paragraph 1.

Appellants explain that the issue with this type of design is the EMF (electromagnetic field) produced. However, what is notable is that such a design provides a very small, negligible current through the sensor wire relative to the current flowing through the conductor and causing heat. In other words, the current flowing through the Gerrard sensor wire 16X is much lower than the current flowing through heating element conductor wire 12X. Appellants do state that with respect to the FIGs. 2 and 3 Gerrard embodiments, "the EMF issue is not addressed as the sensing cable does not carry the heating current." Specification, p. 3, paragraph 2. In other words, the sensing current differs from the heating element current, or the current flowing through sensor wire 16X differs from the current flowing through heating element conductor wire 12X.

FIG. 2 of Mills shows a single heating element 12 and a separate sensor wire 14, where sensor wire 14 is a twin core sensor cable comprising wires 15 and 16 separated by NTC (negative temperature characteristic) material 17. FIG. 3 illustrates a single heating element 12' and a PTC (positive temperature characteristic) sensor wire 14'.

The cited Mills reference shows a similar heating cable/sensor design to that of Gerrard in Mills' FIG. 3, with PTC (positive temperature characteristic) sensor wire 14' sensing overheat conditions in heating element 12'. Again, the current flowing through the sensor wire 14' is much less than the current flowing through heating element 12'. A similar design is provided in FIG. 2, with sensor wire 14 comprising wires 15 and 16 separated by NTC (negative temperature characteristic) material 17 and "when an overheating condition occurs in the blanket, the elevated temperature causes the NTC material to become conductive, thus shorting out the gate signals to the switches 25, 26..." Mills, col. 5, ll. 17-20.

The specific currents employed, or even relative current levels, are missing entirely from Mills.

Appellants submit that specific currents or relative currents are not discussed in Mills, and Mills does not disclose equal currents flowing in opposite directions as

claimed, because Mills solves a fundamentally different problem compared to the present design: Mills ignores or does not address the EMF issue, and simply seeks to provide a reusable heating device, one where sensor operation cuts off current flow to heating element 12 using switches that can be reset so that the circuitry and heating apparatus can be reused. While such a design can in certain instances have some utility, Appellants recognized that such a design, having similarities to the Gerrard device, can produce excessive and undesirable levels of EMF. The EMF issue is discussed at p. 1, paragraph 2 of the Specification, as well as Appellants note that one particular benefit of the present design, as compared with previous designs such as Mills and Gerrard, is the EMF benefit explained at p. 7, paragraph 3 of the Specification:

> With regard to the EMF issue, given that power is supplied to one end only of the cable, and that the core 1 and heating wire 5 are connected in series as a result of being connected together at the other end of the cable via current monitor 10, even if there is some leakage current through the separation layer 4 at any point along the length of the cable *substantially identical currents pass through adjacent positions of the core 1 and heating wire 5, those currents being in opposite directions to each other. As a result there is substantially no electromagnetic radiation emitted from the cable.*

(Emphasis added)

Gerrard apparently recognized this EMF issue, as the FIG. 1 embodiment, which differs from the Mills reference, but provides no PTC sensing element as discussed by Appellants (Specification, p. 3, paragraph 1). Mills simply did not recognize or address the EMF issue.

Again, nowhere in Mills is any disclosure showing first and second conductors connected at a second end of a cable to an AC power supply such that *equal currents flow in opposite directions through adjacent portions of the first and second conductors* as required by the express language of claim 1. Equal currents do not flow in opposite

directions in either of the FIG. 2 or FIG. 3 embodiments of Mills when connected to an AC power supply as claimed.

To the extent currents are discussed at all with respect to the FIG. 2 or FIG. 3 embodiments of Mills, such discussions are limited to alternating current being provided and interrupted under certain conditions (Mills, col. 4, ll. 15-19; col. 5, ll. 17-22), and operation of the "Quadrac," in the form of switches 25 and 26, "which can...conduct current in either direction, and be triggered for conducting current in either direction by the application of gate signals." Mills, col. 4, ll. 29-37. What is not said about the "Quadrac," and what is not true about the Quadrac, is the existence of ***equal currents flowing in opposite directions*** through adjacent portions of a first conductor and second conductor, as claimed in claim 1.

Providing equal currents in opposite directions along the heating wires (first conductor and second conductor) as claimed provides for a low EMF cable, a desirable aspect of the present design. The sensor wire of Mills, namely sensor wire 14, must carry some amount of current and must therefore generate EMF, possibly or even likely out of phase with the heating element current, thereby further increasing EMF. In short, and with respect to the claim language employed, the Mills design does not disclose or suggest ***equal currents flowing in opposite directions*** through adjacent portions of a first conductor and second conductor, nor is it apparent how the Mills reference could be modified to provide such claimed functionality.

B. "...connected in series..."

In FIG. 2 of Mills, sensor wire 14 and heating element 12 are not coupled together, or connected in series or in parallel, but instead are separate. The wiring from sensor wire 14 originates at element 30 and terminates at element 30 without contacting heating element 12, and vice versa. In FIG. 3 of Mills sensor wire 14' and heating element 12' are connected in parallel. Neither embodiment meets the requirement of claim 1 that the first and second conductors are "connected in series" and equal currents flow in opposite directions when connected to an AC power supply. For this further

reason, claim 1 is not obvious based on Mills alone or in combination with the other cited references.

C. "...separation layer has a [NTC]... first conductor has a [PTC] ..."

Appellants further dispute that Mills shows a design "wherein the separation layer [separation layer 4] is formed such that the *separation layer has a negative temperature characteristic*, and the first conductor [first conductor 1] is formed such that the *first conductor has a positive temperature characteristic.*" Appellants specifically note that the heating cable is claimed to comprise "a first conductor which extends along the length of the cable[,] a second conductor which extends along the length of the cable [and] a separation layer which extends along the length of the cable and is interposed between the first and second conductors ..." Thus the cited reference must show a cable having a first conductor and a separation layer each extending along the length of the cable, the first conductor having a positive temperature characteristic (PTC) and the separation layer having a negative temperature characteristic (NTC). Mills simply does not disclose or suggest such a cable.

FIG. 2 of Mills shows NTC material 17, but none of sensor wire 14, heating element 12, or other relevant components of the design includes a PTC component. In any event, NTC material 17 is not between sensor wire 14 and heating element 12 (the first and second conductors required by claim 1), but rather is between the twin wires 15, 16 forming sensor wire 14. Mills does show a PTC resistive component in the controller/control housing 20 (separate from heating element 12 and sensor wire 14) in FIG. 2, namely PTC resistor 32, but this resistive component is not a conductor extending "along the length of the cable" as claimed.

FIG. 3, representing a separate embodiment or design from FIG. 3, includes a PTC sensor 14', but no separation layer having an NTC as claimed. This embodiment thus fails to show a first conductor and a separation layer each extending along the length of the cable, the first conductor having a PTC and the separation layer having a NTC. FIG. 3 shows only PTC sensor wire 14' instead of the NTC material 17 of FIG. 2. The

FIG. 3 circuit includes PTC resistor 34', but no NTC component is present in the FIG. 3 embodiment.

The Final Office Action seeks to address this deficiency by pointing to "column 6, lines 51-51". Final Office Action, p. 3. This passage refers to FIG. 3, and does state "PTC resistance sensor wire 14..." Appellants submit that this is a mistake by Mills. The paragraph does speak of "PTC sensor wire 14'..." at col. 6, ll. 54-55, and the preceding paragraph discusses the FIG. 3 design, including sensor wire 14'. Appellants submit that one of ordinary skill in the art would recognize, reading these two paragraphs and viewing the FIG. 3 Mills embodiment, that what was unquestionably intended at line 51 is the term 14', not 14. "Sensor wire 14" (and notably not "PTC sensor wire 14" or "PTC resistance sensor wire 14") refers to the sensor wire 14 in the FIG. 2 embodiment, without PTC, described earlier in Mills.

PTC sensor wire 14' in FIG. 3 demonstrates a PTC resistance wire, but FIG. 3 shows no NTC component save for the irrelevant circuit which does not run the length of a cable. NTC material 17 in FIG. 2 demonstrates an NTC layer, but no PTC component is illustrated in this embodiment. The Mills sensor wire thus EITHER includes NTC material 17 (Mills, col. 4, ll. 10-14, FIG. 2 embodiment) OR a PTC resistance wire (Mills, col. 6, ll. 29-34, FIG. 3 embodiment). Two different and separate circuits are provided by the two embodiments of Mills to control the sensor wire depending on whether the sensor wire contains an NTC material (FIG. 2) or a PTC resistance wire (FIG. 3).

Looking at the final limitation of claim 1, as amended, "wherein the separation layer is formed such that the separation layer has a negative temperature characteristic, and the first conductor is formed such that the first conductor has a positive temperature characteristic", nowhere in Mills is it remotely suggested how or why the two separate Mills sensing wire implementations (FIG. 2 and FIG. 3) could be combined to produce a cable or wire having the combined NTC and PTC properties claimed. The NTC circuit (FIG. 2) operates in the embodiment of FIG. 2 based on the NTC layer 17 being an

insulator at low temperatures. The PTC circuit (FIG. 3) relies on the PTC being a conductor at low temperatures. *The two Mills circuits shown in FIGs. 2 and 3 are therefore mutually exclusive*, and it is neither suggested in Mills nor apparent how a construction as claimed could be formed by using the two mutually exclusive designs of FIGs. 2 and 3.

While Appellants recognize that in some manner, at least conceptually, the embodiments of FIGs. 2 and 3 of Mills could be combined together, Appellants submit that one of ordinary skill in the art seeking to address the issues identified in the present Specification, namely safety, overheating, and the EMF effect, would not have been motivated to combine these distinct embodiments together. Further, even if these circuits could somehow be combined, it would require undue experimentation by one skilled in the art to create a device as claimed having the beneficial heating and EMF attributes discussed. Thus the combination of the circuits of Mills' FIGs. 2 and 3 to produce a device as claimed is simply not feasible.

Appellants submit that there is no apparent step or component or circuit that would enable the Mills sensor wire 14' (PTC) of FIG. 3 to be combined with the Mills NTC material 17 of FIG. 2 into a cable having the combined NTC and PTC properties claimed. Such a combination would require a very different control circuit than either circuit shown in Mills, and furthermore, since sensing wires operate at a much lower current level than heating wires in this type of application, mere substitution of a sensing wire for a heating wire would not operate properly, could be very dangerous, and would result in damage from the higher currents produced.

Further, with respect to two mutually exclusive designs being disclosed in a single reference, and recognizing that the present rejection is based on obviousness, Appellants note that the reference must disclose the claimed invention in as much detail as is recited in the claim. *See,* MPEP 2131; *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989) ("The identical invention must be shown in as complete detail as is contained in the ... claim."); see also, *In re Kotzab*, 217 F.3d 1365,

1371, 55 U.S.P.Q.2d 1313, 1318 (Fed. Cir. 2000). The elements must be arranged as required by the claim. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990). "Concepts do not anticipate. Notions of concept, essence, or gist are no more useful in the context of §102 than elsewhere, because they divert the factfinder's attention from the subject matter as a whole." Harmon, Patents and the Federal Circuit, Sixth Edition, § 3.2a, discussing anticipation. "It is therefore error to treat the claims as a mere catalog of separate parts, in disregard to part-to-part relationships set forth in the claims that give those claims meaning." *Id.*

Mills is relied on to show all of these elements (Final Office Action, p. 2-5), so while the present rejection is indeed one of obviousness, the concept of identity of invention is applicable here. Two separate designs or embodiments of Mills, a single reference, are being used to reject a specifically worded limitation. Here, identity of invention is not satisfied; the cited Mills reference does not show a design comprising a first conductor extending along a length of a cable, a second conductor extending along a length of a cable, and a separation layer extending along the length of the cable, wherein the separation layer is formed such that the separation layer has a negative temperature characteristic, and the first conductor is formed such that the first conductor has a positive temperature characteristic. Thus identity of invention is not satisfied, and the present rejection cannot be maintained.

D. Other Cited References

Gordon Jr.

Regarding Gordon Jr., Gordon Jr. discloses only the use of separate sensor and heating wires (*see, e.g.*, Gordon, Jr., col. 1, ll. 60-63). The sensor wire comprises two spirals separated by a layer of NTC material (see column 4, ll. 43-54). Gordon Jr. fails to show that "when the first and second conductors are connected at a second end of the cable to an AC power supply equal currents flow in opposite directions through adjacent portions of the first and second conductors..." Further, the Gordon Jr. reference fails to

disclose a separation layer and first conductor as claimed, i.e. having a NTC and PTC, respectively.

The Final Office Action relies on Gordon Jr. to reject the "sensor wire" recited in claim 1. Final Office Action, p. 7. Appellants remain confused by this citation, as Gordon Jr. admittedly discloses a sensor wire, but it is entirely unclear what aspects of Gordon Jr. and the Gordon Jr. "sensor wire" are being relied upon in the Final Office Action. In any event, Appellants submit that Gordon Jr. in combination with Mills fails to show the invention claimed in claim 1, as amended, as both references are missing "equal currents flow in opposite directions" and NTC and PTC operation as claimed in claim 1.

Sopory

Sopory discloses a variety of different materials (PTC, NTC, ZTC) that may be laminated onto an etched foil layer and used for heating. The Final Office Action seeks to combine this Sopory design with the disclosure of Mills and the Gordon Jr. "sensor wire."

Sopory is not relied upon to reject the "equal currents flow in opposite directions" limitation of claim 1. As a result, the combination of Mills, Gordon Jr., and Sopory does not render claim 1 obvious, as claim 1, as amended, includes a limitation ("equal currents flowing in opposite directions...") not found in the cited references, alone or in combination. Claims depending from claim 1 are also not obvious as they include limitations not found in the cited references.

Further, Appellants note that the PTC/NTC/ZTC design of Sopory is "laminated onto an etched foil layer," and is a fundamentally different design from that presented in the present application. Sopory, col. 2, ll. 49-52. The Sopory design does not demonstrate a first conductor extending along a length of a cable, a second conductor extending along a length of a cable, and a separation layer extending along the length of the cable, wherein the separation layer is formed such that the separation layer has a

negative temperature characteristic, and the first conductor is formed such that the first conductor has a positive temperature characteristic. Again, it is not obvious how the lamination of PTC and NTC materials onto an etched foil layer could be made into a cable as claimed, specifically a first conductor and a separation layer having the properties claimed. Such a combination would require a very different construction than the laminated etched foil layer shown in Sopory. Insertion of the Sopory design into Gordon Jr. and/or Mills would simply not operate in an appropriate manner.

Regarding the combination of Mills and Sopory with respect to the language of amended claim 1, in FIG. 2 of Mills, sensor wire 14 and heating element 12 are not coupled together, but are separate. In FIG. 3 of Mills, sensor wire 14' and heating element 12' are connected in parallel. Neither embodiment meets the requirement of claim 1 that the first and second conductors are "connected in series" and equal currents flow in opposite directions when connected to an AC power supply. Again, Sopory fails to cure this deficiency.

Thus Appellants submit that the combination of Mills and the fundamentally different Sopory design are missing limitations from claim 1, as amended, and for this further reason claim 1 is nonobvious in view of the cited references. Claims depending from claim 1 are allowable as they include limitations not found in the cited references.

Appellants thus also dispute the combination of Mills, Gordon Jr., and Sopory. It is only though the use of hindsight that a construction such as that claimed may be achieved by employing Gordon Jr. and Sopory to fill in the gaps of Mills. With respect to combining references, the Examiner has the initial duty of supplying the requisite factual basis and may not, because of doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. *See In re Warner*, 379 F.2d 1101, 1017 (CCPA 1967).

Here, the Examiner does not cogently explain why one skilled in the art would be motivated to take the Mills embodiments and address its deficiencies using the laminated etched foil NTC/PTC/ZTC applications of Sopory and/or the Gordon sensor wire.

Appellants submit that it is important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). The conclusion of obviousness appears born from the use of impermissible hindsight reconstruction in view of Appellants' Specification and claims.

"To support a conclusion that a claim is directed to obvious subject matter... an Examiner must present a "convincing line of reasoning' as to why one of ordinary skill in the art would have found the claimed invention to have been obvious. *Ex parte Clapp*, 227 USPQ 972, 973 (BPAI 1985). When determining whether a rejection based on design choice is appropriate, the Examiner must review the Specification and ascertain if the limitation in question is disclosed as serving any advantage or particular purpose, or whether it solves a stated problem. The Examiner also should explain the reasoning used to determine that the prior art would have performed equally as well as the claimed invention. These two steps help present a "convincing line of reasoning." *Ex parte Clapp*, 227 USPQ at 973.

The Final Office Action presents no convincing line of reasoning for combining the references in the manner suggested other than a broad, conclusory assertion. The deficiencies of Mills are filled in with the Gordon Jr. sensor wire and the Sopory laminated etched foil applications "to protect electrical circuit for the heating cable of Mills by using PTC conductor and NTC separation layer." Final Office Action, p. 8. This is not a motivation to combine – this is a dismissive statement used to cobble together references in an effort to deprecate the claims. The question is why one would need to resort to the laminated etched foil applications or sensor wire when designing a heating apparatus as claimed. The Final Office Action fails to explain what reasoning supports the contention that one skilled in the art would have been motivated to resort to the Sopory laminated etched foil applications and/or Gordon Jr. sensor wire to address the failure of the Mills embodiments to address the EMF problem identified by Appellants, i.e. provide a design wherein equal currents flow in opposite directions through the conductors as claimed. The articulated motivation is not a motivation to

combine, but instead an after-the-fact justification of combining unrelated references in an effort to invalidate allowable claims.

Appellants submit that there is no reasoning supporting combining the cited Mills reference with the cited Gordon Jr. and/or Sopory references, and that it is only through the use of impermissible hindsight that the Appellants' claims may be constructed from the reference and purported knowledge in the art. Such hindsight reconstruction of the invention is impermissible. *In Re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991); *In Re Laskowski*, 871 F.2d 115, 117 (Fed. Cir. 1989); *see also*, *Ex Parte Lange*, 72 U.S.P.Q. 90, 91 (C.C.P.A. 1947).

The Patent Office must show that some reason to combine the elements with some rational underpinning that would lead an individual of ordinary skill in the art to combine the relevant teachings of the references. *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398 (2007); *In re Fine*, 837 F.2d 1071, 1074 (Fed. Cir. 1988). Therefore, a combination of relevant teachings alone is insufficient grounds to establish obviousness, absent some reason for one of ordinary skill in the art to do so. *Fine* at 1075.

None of the references, alone or in combination, teaches the unique features called for in the claims. It is impermissible hindsight reasoning to pick a feature here and there from among the references to construct a hypothetical combination which obviates the claims.

> It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selecting elements from references to fill the gaps. [*citation omitted*]

In re Gordon, 18 USPQ.2d 1885, 1888 (Fed. Cir. 1991).

A large number of devices may exist in the prior art where, if the prior art be disregarded as to its content, purpose, mode of operation and general context, the several elements claimed by the applicant, if taken individually, may be disclosed. However, the important thing to recognize is that the reason for combining these elements in any way

to meet Appellants' claims only becomes obvious, if at all, when considered from hindsight in the light of the application disclosure. The Federal Circuit has stressed that the "decisionmaker must step backward in time and into the shoes worn by a person having ordinary skill in the art when the invention was unknown and just before it was made." *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1566 (Fed. Cir. 1987). To do otherwise would be to apply hindsight reconstruction, which has been strongly discouraged by the Federal Circuit. *Id.* at 1568.

> To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.

W.L. Gore & Assoc. v. Garlock, Inc., 721 F.2d 1540, 1553 (Fed. Cir. 1983). Therefore, without some reason in the references to combine the cited prior art teachings, with some rational underpinnings for such a reason, the Examiner's conclusory statements in support of the alleged combination fail to establish a prima facie case for obviousness. *See, KSR International Co. v. Teleflex Inc.*, No. 04-1350, 550 U.S. ___ (2007) (obviousness determination requires looking at "whether there was an apparent reason to combine the known elements in the fashion claimed...", *citing In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness," KSR at 14).

Simply stating that the invention would have been obvious to a person of ordinary skill is also insufficient, for the assertion must be supported by clear and convincing evidence. *Panduit, supra*, 810 F.2d at 1568. The Final Office Action merely states that the invention would be obvious in light of the proposed combination, and did not provide clear and convincing evidence or reasoning to support this assertion.

The Examiner has failed to avoid the effects of hindsight reasoning in fashioning the combination of Mills, Gordon Jr., and Sopory, and for these further reasons,

independent claim 1 is allowable. Claims depending from allowable claim 1 are also allowable as they include limitations missing from the cited references.

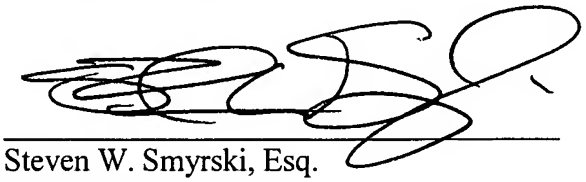
Accordingly, it is respectfully submitted that all pending claims fully comply with 35 U.S.C. § 103.

CONCLUSION

In view of the foregoing, Appellants submit that all pending claims are patentably distinct over the prior art and are allowable. Thus the Final Office Action rejecting all pending claims is in error and should be reversed.

Appellants believe that no fees are due in accordance with this Appeal Brief beyond those included herewith. Should any additional fees be due or overpayment made, the Commissioner is hereby authorized to charge any deficiencies or credit any overpayment to Deposit Account 502026.

Respectfully submitted,



Date: April 22, 2010

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8. CLAIMS APPENDIX

1. A heating cable comprising:

a first conductor which extends along the length of the cable;

a second conductor which extends along the length of the cable;

a separation layer which extends along the length of the cable and is interposed between the first and second conductors; and

an outer insulating jacket extending along the length of the cable and around the first and second conductors and the separation layer;

wherein the first and second conductors are connected at a first end of the cable in series such that current can flow in both directions through the first and second conductors and when the first and second conductors are connected at a second end of the cable to an AC power supply equal currents flow in opposite directions through adjacent portions of the first and second conductors; and

wherein the separation layer is formed such that the separation layer has a negative temperature characteristic, and the first conductor is formed such that the first conductor has a positive temperature characteristic.

2. A heating cable according to claim 1, wherein the first and second conductors are coaxial and the separation layer is tubular, the first conductor being located inside the tubular separation layer and the second conductor being located outside the tubular separation layer.

3. A heating cable according to claim 2, wherein the first conductor is formed from twisted together components each of which comprises a fibre core around which a positive temperature coefficient wire has been wrapped to form a helix.

Claims 4-11. (cancelled)

12. A heating cable according to claim 2, wherein the second conductor is a heating wire wrapped around the tubular separation layer to form a helix.

13. A heating cable according to claim 3, wherein the second conductor is a heating wire wrapped around the tubular separation layer to form a helix.

14. (canceled)

15. (canceled)

16. (canceled)

17. A heating cable according to claim 1, wherein the separation layer is formed such that the separation layer melts if heated to a predetermined threshold temperature.

18-28. (canceled)

9. EVIDENCE APPENDIX

None.

10. RELATED PROCEEDINGS APPENDIX

None.